



Stitchless Cooling/Heating Undergarments

Overview:

This technology incorporates fusible fabric engineering to laminate polymeric tubing arranged in a desired configuration for optimum personal garment cooling/heating efficiency. The resulting fabric structure is stretchable, recoverable, flexible, air permeable, water vapor permeable, durable and lightweight. Furthermore, it can be produced at a fraction of the cost of current commercially available garments which uses sewn-in tubing or heavier weight nonbreathable bladder design. Garment item is then attached to separate cooling / heating unit with pump for operation. Technology allows fabric to be manufactured in a flat form and can be used as a blanket type application for either sleeping bags, tent liners or just body blanket to either heat or cool. Technology allows for:

- Cost savings
- Recessed slots on board provides heat protection for tubing
- Increased comfort
- Potential integration into any body conforming garment
- High efficiency (body form-fitting)
- Potential integration into Chemical Protective (CP) Uniforms.

Military Applications:

- Cooling / Heating for Desert / Arctic warfare
- Cooling in CP configuration
- Aircrew, dismounted soldier, depot worker, shipcrew and explosive ordnance applications

Commercial Applications:

- Power plant, medical, race car, Hazmat, mining and outdoor civilian usage
- Potential for vacuum fed microwave gel technology for short term cold weather operations or for phase change material to be pumped into tubing for heating or cooling.

New Improved Pattern Board: Pattern board constructed of high heat resist plastic that allows virtually any pattern of tubing of pre-determined diameter to be configured into any size / shape and/or pattern design end-item. Selected lightweight knitted fabrics with fusible adhesive dots application allows for desirable characteristics, i.e. (use of lightweight cotton tee-shirt material to be used for max cooling and high pile knit to be used for max heating). End result is tri-laminate construction of inner knit (against the body) / tubing arrangement / outershell knit). Wovens, without stretch, or plastic films may also be used with pattern board. Board design also allows electrical wire or fiber optic cable to be laminated.

Status:

Currently being funded under Air Warrior AMD program. Process patent pending.

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